REMARKS

Claims 1-29 are pending in this application. No new matter has been added by this Request for Reconsideration.

Claim Rejections Under 35 U.S.C. § 103(a)

Rejection – Claims 1-6, 13-16 and 19-29

Claims 1-6, 13-16 and 19-29 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,496,375 ("La Vantine") in view of U.S. Patent No. 5,055,963 ("Partridge"). The Examiner takes the position that Le Vantine discloses an ionizer apparatus and a method of removing ions wherein the improvement includes a filter comprising a metal screen being electrically coupled to ground and positioned over the air inlet. The Examiner acknowledges that Le Vantine does not disclose that the ionizer has a positive and a negative electrode, but the Examiner takes the position that it would have been obvious to use a positive and negative electrode because a positive and negative electrode are needed to establish "a self-balancing effect." (Partridge, col. 4, lines 51-55).

The Examiner further takes the position with regards to claims 4-6 that Le Vantine also discloses a filter comprising a metal screen that is electrically coupled to a DC voltage source and is positioned over the air inlet.

The Examiner further takes the position with regards to claims 13-14 and 25-29 that Le Vantine discloses a filter comprising a metal screen coupled to a DC voltage source that is positioned over the air inlet. The Examiner acknowledges that Le Vantine does not disclose that the electrode is coupled to an AC power source, but the Examiner takes the position that Partridge discloses an air ionizer in which the electrodes are supplied with AC current alternately generating positive and negative ions.

Applicants respectfully traverse the rejection of claims 1-6, 13-16 and 19-29.

Present Invention

The present invention is directed to an improved bipolar air ionizer apparatus having an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet. The improvement includes a foraminous filter comprising an electrically conductive material. The filter is electrically coupled to at least one of a voltage source and ground. The filter is positioned over at least one of the air inlet, the air outlet and the electrodes, such that air flowing into the air inlet, air flowing out of the air outlet of air flowing past the electrodes flows through the filter.

The present invention is also directed to a method of removing ions from air flowing into a bipolar air ionizer having an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet. The method includes the steps of placing a foraminous filter comprising an electrically conductive material over the air inlet and coupling the filter to one of a voltage source and ground. The Examiner states it would have been obvious to use AC current to apply to the electrodes because the device can have the convenience of having a connector plug suitable for engagement with a standard utility outlet.

La Vantine

La Vantine discloses an air cleaning device including an electrostatic apparatus which removes particulates from the air by causing them to be precipitated on an electrically charged grid having a positive polarity. The device shown in Fig. 1 includes a dielectric conduit structure 20, open at both ends. One end is the air inlet 22 and the other is the air outlet 24. Three sets of electrically charged elements 23, 25, 29 are positioned within the conduit 20, including, in order, a first grid structure 23 maintained at a high negative electrical potential, a

needle electrode 25 also maintained at a high negative electrical potential, and a second grid structure 29 maintained at a high positive potential. The air molecules and particulates 11 are charged negatively by the needle electrode 25 and are forced away from the negatively charged first grid 23 structure and drawn toward the positively charged second grid structure 29, by electrostatic forces, causing the air to move through the conduit 20. The negatively charged particulates 16 are attracted to and precipitated on the second grid structure 29.

An alternate embodiment is shown in FIG. 4 which utilizes two stages of ion pumping in series that are each nearly identical to the single stage ion "pumper" shown in Fig. 1. A hollow cylindrical structure 60 is mounted on a base 76. A first stage consists of negative grid 63, negative electrode 65 and positive grid 69. Molecule or particulate 54 enters the device through the upper open end 62 of cylinder 60 as indicated by direction arrows 55. Passing through the negative grid 63, the molecule or particulate 54 receives a negative charge directly or indirectly from negative electrode 65, as indicated by charged molecule or particulate 57, and is propelled in direction 56 toward positive grid 69 where it gives up its charge and proceeds onward through the cylinder 60, as indicated by arrows 58. Molecule or particulate 59 proceeds through grounded screen 68 which serves to electrically separate the first propelling stage just described, from the second propelling stage below. The second stage is identical to the first consisting of negative grid 70, negative electrode 75 and positive grid 72. The molecules or particulates are negatively charged by the electrode and propelled toward the positive grid, as above, and exit the apparatus through openings 74 as indicated by arrows 79. The propulsion of the first stage is augmented by the propulsion from the second stage. In the embodiment shown in FIG. 4, particulates are collected on both positive grids 69 and 72.

Partridge

Partridge discloses a bipolar air ionizing apparatus 11 that includes a hollow housing 12 which is a portable rectangular box. Housing 12 has a back wall 13 with a broad air inlet passage 14 and a front wall 16 with a similar air outlet passage 17. Grills 18 and 19, each having open areas 21, are secured to the front and back walls 16 and 13 respectively to prevent entry of human fingers and other sizable objects into the housing 12. A duct 22 is attached to and supported by the housing front wall 16. Airflow 24 is created by a rotary fan 25 having an

electrical motor 26 which is positioned in coaxial relationship with duct 22. A sub-housing 32 contains the electrical components of the ionizer 11 and is situated out of the path of the airflow 24. A plurality of needle electrodes 34 and 35 extend radially inwardly into the airflow path are connected to high voltages from the ionizer control circuit. The electrodes 34, 35 extend from electrical insulators 36 which are attached to the inner walls of housing 12. A positive electrode 34 and a negative electrode 35 are provided to establish a self-balancing effect. In Fig. 3, there are two positive electrodes 34 and two negative electrodes 35 situated between duct 22 and the housing backwall 13. The two positive electrodes 34 are colinear and the two negative electrodes 35 are also colinear and oriented at right angles to the positive electrodes. A flow of charged ions from an electrode 34, 35 to any nearby grounded conductor or low resistance path to ground detracts from the desired self-balancing effect. This is prevented by forming components that might otherwise provide a low resistance path to ground of plastic or other insulative material or by covering such components with a layer of insulative material. (Col. 4, line 67 – col. 5, line2) The housing 12 including grills 18 and 19, duct 22 and hub 28 and blades 29 of fan 25 are all formed wholly of insulative plastic. Components which are necessarily conductive and grounded, such as portions of motor 26 and circuit sub-housing 32, are covered with layers 39 of insulative material. The electrical circuit of the air ionizer 11 receives alternating current from a utility power source through a plug 43 and power cord 44 having a pair of conductors 46 and 47 with conductor 47 being the neutral or grounded conductor.

Claim 1

Claim 1 recites, *inter alia*:

> a bipolar air ionizer apparatus comprising an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet, wherein the improvement comprises:
>
> a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage

> source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrodes, such that air flowing into the air inlet, air flowing out of the air outlet of air flowing past the electrodes flows through the filter.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrodes.

La Vantine merely discloses an electrostatic air cleaning device having only a negative electrode (25, 65, or 75) in combination with a negatively charged grid (23, 63 and/or 70) and a positively charged grid (29, 69 and/or 72). The negative electrode (25, 65, or 75) is intended to negatively charge particulate matter in the air and the negatively charged grid (23, 63 and/or 70) is intended to cause the negatively charged particulate matter to be repulsed while the positively charged grid (29, 69 and/or 72) is intended to cause the particulate matter to be attracted. The negatively charged and positively charged grids of Le Vantine do not generate ions. The positively charged grid (29, 69 and/or 72) is intended to attract and remove particulate matter from the air, not to balance ions in the air stream.

To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. MPEP § 2143.03.

As discussed above, La Vantine does not disclose, teach or suggest a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrodes, as claimed in claim 1.

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. MPEP § 2143.03. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination. MPEP § 2143.01.

Taken as a whole, Le Vantine teaches an air cleaning device where negatively charged ions are used to charge dirt particles which are then attracted to a positively charged grate. This would lead one away from the present invention wherein bipolar ionization is being used.

Furthermore, Partridge specifically notes that a flow of charged ions from an electrode to any nearby grounded conductor or low resistance path to ground detracts from the desired self-balancing effect and that this is prevented by forming components that might otherwise provide a low resistance path to ground of plastic or other insulative material or by covering such components with a layer of insulative material. The housing including grills, duct and hub and fan blades are all formed wholly of insulative plastic. (Col. 4, line 67 – col. 5, line 6). Thus, the teachings of Partridge would deter one from using bipolar ionizing pins in an ionizer having a grid or filter formed of an electrically conductive material which is electrically coupled to at least one of a voltage source and ground, as opposed to suggesting such a modification. Thus, the teachings of Le Vantine and Partridge do not suggest the desirability of combining Le Vantine and Partridge in the manner proposed by the Examiner.

It is, therefore, respectfully submitted that claim 1 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 1 and dependent claims 2-6 should be withdrawn.

Claim 15

Claim 15 reads:

> a method of removing ions from air flowing into a bipolar air ionizer having an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to

> generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:
>
> placing a foraminous filter comprising an electrically conductive material over the air inlet; and
>
> coupling the filter to one of a voltage source and ground.

La Vantine fails to disclose, teach or suggest a method of removing ions from air flowing into a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the method comprises the steps of placing a foraminous filter over the air inlet and coupling the filter to one of a voltage source and ground, as claimed in claim 15. It is, therefore, respectfully submitted that claim 15 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 15 and dependent claim 16 should be withdrawn.

Claim 19

> Claim 19 reads:
>
> a method of removing ions from air flowing into a bipolar air ionizer having an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:

placing a foraminous filter comprising an electrically conductive material around the electrodes; and

coupling the filter to one of a voltage source and ground.

La Vantine fails to disclose, teach or suggest a method of removing ions from air flowing into a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the method comprises the steps of placing a foraminous filter around the electrodes and coupling the filter to one of a voltage source and ground, as claimed in claim 19. It is, therefore, respectfully submitted that claim 19 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 19 and dependent claim 20 should be withdrawn.

Claim 21

Claim 21 recites, *inter alia*:

a bipolar air ionizer apparatus comprising an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet, wherein the improvement comprises:

a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to one of a voltage source and ground, the filter being positioned on an interior surface of the bipolar air ionizer apparatus, such that at least a portion of the air flowing past the electrodes engages the filter.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the apparatus includes a foraminous filter being electrically coupled to one of a voltage source and ground, as claimed in claim 21. It is, therefore, respectfully submitted that claim 21 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 21 and dependent claim 22 should be withdrawn.

Claim 23

Claim 23 reads:

> a method of removing unwanted ions from air flowing out of a bipolar air ionizer, the bipolar air ionizer having an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:
>
> placing a foraminous filter comprising an electrically conductive material over an interior surface of the bipolar air ionizer apparatus proximate to the electrodes; and
>
> coupling the filter to one of a voltage source and ground.

La Vantine fails to disclose, teach or suggest a method of removing ions from air flowing into a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the method comprises the steps of placing a foraminous filter around the electrodes

and coupling the filter to one of a voltage source and ground, as claimed in claim 23. It is, therefore, respectfully submitted that claim 23 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 23 and dependent claim 24 should be withdrawn.

Claim 25

Claim 25 recites, *inter alia*:

> a bipolar air ionizer apparatus comprising an air inlet, a high voltage source having a high voltage alternating current power supply, an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrode and out of the bipolar air ionizer through the air outlet, wherein the improvement comprises:
>
> a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrode, such that air flowing into the air inlet, air flowing out of the air outlet of air flowing past the electrode flows through the filter.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrodes. It is, therefore, respectfully submitted that claim 25 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully

requested that the rejection under 35 U.S.C. § 103(a) of claim 25 and dependent claims 13-14 under 35 U.S.C. § 103(a) should be withdrawn.

Claim 26

Claim 26 recites, *inter alia*:

> a method of removing ions from air flowing into a bipolar air ionizer having an air inlet a high voltage source having a high voltage alternating current power supply, an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrode and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:
>
> placing a foraminous filter comprising an electrically conductive material over the air inlet; and
>
> coupling the filter to one of a voltage source and ground.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground. It is, therefore, respectfully submitted that claim 26 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 26 under 35 U.S.C. § 103(a) should be withdrawn.

Claim 27

Claim 27 recites, *inter alia*:

> a method of removing ions from air flowing into a bipolar air ionizer having an air inlet, a high voltage source having a high voltage alternating current power supply, an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrode and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:
>
> placing a foraminous filter comprising an electrically conductive material around the electrode; and
>
> coupling the filter to one of a voltage source and ground.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground. It is, therefore, respectfully submitted that claim 27 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 27 under 35 U.S.C. § 103(a) should be withdrawn.

Claim 28

> Claim 28 recites, *inter alia*:
>
> a bipolar air ionizer apparatus comprising an air inlet, a high voltage source having a high voltage alternating current power supply, an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrode and out of the bipolar air ionizer through the air outlet, wherein the improvement comprises:

> a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to one of a voltage source and ground, the filter being positioned on an interior surface of the bipolar air ionizer apparatus, such that at least a portion of the air flowing past the electrodes engages the filter.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground. It is, therefore, respectfully submitted that claim 28 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 28 under 35 U.S.C. § 103(a) should be withdrawn.

Claim 29

> Claim 29 recites, *inter alia*:
>
> a method of removing unwanted ions from air flowing out of a bipolar air ionizer, the bipolar air ionizer having an air inlet, a high voltage source having a high voltage alternating current power supply, an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrode and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:
>
> placing a foraminous filter comprising an electrically conductive material over an interior surface of the bipolar air ionizer apparatus proximate to the electrode; and
>
> coupling the filter to one of a voltage source and ground.

La Vantine fails to disclose, teach or suggest a bipolar air ionizer apparatus having an electrode electrically connected to the high voltage alternating current power supply and configured to alternately generate positive polarity ions and negative polarity ions, and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground. It is, therefore, respectfully submitted that claim 29 is not obvious over La Vantine and there is no desirability or suggestion to modify La Vantine by the bipolar electrodes of Partridge as proposed by the Examiner for all of the reasons cited above regarding claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 29 under 35 U.S.C. § 103(a) should be withdrawn.

Rejection – Claims 1, 7-8, and 17-18

Claims 1, 7-8, and 17-18 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,864,459 (Larigaldie *et al.*, hereinafter, "Larigaldie"). The Examiner takes the position that Larigaldie discloses an ionizer apparatus and a method of removing ions wherein the improvement includes a filter comprising a metal screen being electrically coupled to ground and positioned over the air outlet. The Examiner acknowledges that Laragaldie does not disclose that the air ionizer has a positive and a negative electrode, but the Examiner takes the position that it would have been obvious to use a positive and negative electrode because a positive and negative electrode are needed to establish "a self-balancing effect." (Partridge, col. 4, lines 51-55).

It appears based on the language of the rejection (i.e., the quotation of Partridge) that the Examiner intended to make a rejection under 35 U.S.C. § 103(a) over Larigaldie in view of Partridge. The Applicants response below addresses such an obviousness rejection. Otherwise, claim 1 is not anticipated by Larigaldie under 35 U.S.C. § 102 because each and every element as set forth in claim 1 is not found expressly or inherently described in Laragaldie as acknowledged by the Examiner.

Applicants respectfully traverse the rejection of claims 1, 7-8, and 17-18.

Larigaldie

Larigaldie discloses a laminar flow hood 1 with a static electricity eliminator 2. The cabinet comprises two side walls 11 and 12, a rear wall 13, and is covered by a ceiling 10. Substantially halfway up the cabinet there is a work surface 15. Block 18 represents a hood for producing a laminar flow of filtered air which enters into the cabinet through its ceiling 10 and moves down towards the work surface 15. The laminar flow hood 1 provides for the addition of the electrostatic electricity eliminator device 2 and its associated high-tension electronics 3 being added to the hood.

The static electricity eliminator device 2 includes a rigid frame 20 having a first set of wires 21-1 to 21-n which are interconnected at 23 and a second set of wires 22-1 to 22-n which are interconnected at 24. The wires in the two sets 21-1-21-n, 22-1-22-n are parallel, coplanar, extend taut over the rigid frame, and are equidistant not only within each set but also between the two sets. The connection 23 common to all the wires of the first set is connected to a terminal 25. The connection 24 common to all the wires of the second set is connected to a terminal 26. The two terminals 25, 26 are connected to the electronics 3 which produces an alternating high tension with a peak amplitude of between 4 KV and 10 KV. The electronics 3 comprises a power supply 30. The output from the power supply 30 is applied to the primary winding 31 of a transformer 32. The secondary winding 33 of the transformer has terminals 35 and 36. The terminal 35 is connected to the terminal 25 either via a capacitor 38 or else directly, and the terminal 36 is connected to the terminal 26 either directly, or else via a capacitor 39. Thus, there is an alternately-charged grid of bare wires (the second set of wires 22-1-22-n) and an alternately-charged grid of insulated wires (the first set of wires 21-1-21-n) which provides the static electricity elimination functions.

Claim 1

Larigaldie fails to disclose, teach or suggest a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the apparatus includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at

least one of a voltage source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrodes.

Taken as a whole, Larigaldie merely discloses a static electricity eliminating device with an alternately-charged grid of bare wires and an alternately-charged grid of insulated wires to eliminate static electricity in a laminar flow exhaust hood. Larigaldie, in the Background of the Invention Section, specifically discusses the disadvantages of using Corona discharge type ionizers, such as the type disclosed in Partridge, in Laminar flow hoods. (Col. 3, lines 10-35). In particular, Laragaldie states that irremediable equipment damage and degradation of equipment operation may occur from use of Corona ionizers like the one in Partridge, and proposes that the wire grid device addresses such problems. Accordingly, modifying Larigaldie by Partridge would teach away from the principles of Larigaldie.

Furthermore, as mentioned above Partridge specifically notes that a flow of charged ions from an electrode to any nearby grounded conductor or low resistance path (such as grid 6 in Laragaldie) to ground detracts from the desired self-balancing effect and that this is prevented by forming components that might otherwise provide a low resistance path to ground of plastic or other insulative material or by covering such components with a layer of insulative material. The housing including grills, duct and hub and fan blades are all formed wholly of insulative plastic. (Col. 4, line 67 – col. 5, line 6). Thus, the teachings of Partridge would deter one from using bipolar ionizing pins in an apparatus having a grid or filter formed of an electrically conductive material which is electrically coupled to at least one of a voltage source and ground, as opposed to suggesting such a modification. Thus, the teachings of Laragaldie and Partridge do not suggest the desirability of combining Laragaldie and Partridge in the manner proposed by the Examiner, but rather, they teach away from such a modification.

It is, therefore, respectfully submitted that claim 1 is not obvious over Laragaldie, there is no desirability or suggestion to modify Laragaldie by the bipolar electrodes of Partridge as proposed by the Examiner, and the teachings of Laragaldie and Partridge teach away from such a modification. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 1 and dependent claims 7-8 should be withdrawn.

Claim 17

Claim 17 reads:

> a method for removing unwanted ions and ionization noise from ionized air flowing out of a bipolar air ionizer, the bipolar air ionizer having an air inlet, a high voltage source, a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions, a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions, an air outlet and an air mover for causing air to flow into the bipolar air ionizer through the air inlet, around the electrodes and out of the bipolar air ionizer through the air outlet, the method comprising the steps of:
>
> placing a foraminous filter comprising an electrically conductive material over the air outlet; and
>
> coupling the filter to one of a voltage source and ground.

Larigaldie fails to disclose, teach or suggest a method of removing ions from air flowing into a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the method comprises the steps of placing a foraminous filter comprising an electrically conductive material over the air outlet and coupling the filter to one of a voltage source and ground, as claimed in claim 17. Thus, claim 17 is not obvious over Laragaldie. Further, there is no desirability or suggestion to modify Laragaldie by the bipolar electrodes of Partridge as proposed by the Examiner and the teachings of Laragaldie and Partridge teach away from such a modification for all of the reasons set forth above with respect to claim 1. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of claim 17 and dependent claim 18 should be withdrawn.

Rejection – Claims 9-12

Claims 9-12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,375,714 ("Rump *et al.*," hereinafter, "Rump"). The Examiner takes the

position that Rump discloses an ionizer apparatus wherein the improvement includes a filter comprising a metal screen being electrically coupled to a DC feedback voltage and positioned and positioned over the air outlet for sensing ion content. The Examiner acknowledges that Rump does not disclose an ionizer having a positive and negative electrode, but the Examiner takes the position that it would have been obvious to use a positive and negative electrode because a positive and negative electrode are needed to establish "a self-balancing effect." (Partridge, col. 4, lines 51-55).

It appears based on the language of the rejection (i.e., the quotation of Partridge) that the Examiner intended to make a rejection under 35 U.S.C. § 103(a) over Rump in view of Partridge. The Applicants response below addresses such an obviousness rejection. Otherwise, claims 9-12 are not anticipated by Rump under 35 U.S.C. § 102 because each and every element as set forth in claims 9-12 are not found expressly or inherently described in Rump as acknowledged by the Examiner.

Applicants respectfully traverse the rejection of claims 9-12.

Rump

Rump discloses an air ionizer for producing active oxygen ions in the air for improved air quality. The air ionizer is coupled to grid-like, flat structures 12.2, 12.3, 12.4 that are disposed inside of an insulated frame 12.1, which forms a flow channel for air fed through. The grid-like, flat structures 12.2, 12.3, 12.4 are planar, grid like bodies and exhibit electrically conducting surfaces. The bodies 12.2, 12.3, 12.4 are disposed planar parallel on top of each other in the air stream and are contacted electrically such that they exhibit in each case a changing electrical potential. The material of the grid like flat bodies 12.2, 12.3, 12.4 is wire fabric, punched metal parts or the like electrically conducting material. The production rate of the ions is purportedly increased by a construction of electrically conducting flat bodies 13.1 by the situation that the electrically conducting flat bodies, or the flat bodies 12.2, 12.3, 12.4 which are constructed similar to barbed wire and are provided with numerous needle shaped or tooth shaped projections 13.2, at which projections 13.2 the corona effect occurs.

Claim 1

Rump fails to disclose, teach or suggest a bipolar air ionizer apparatus having a first electrode electrically connected to the high voltage source and configured to generate positive polarity ions and a second electrode electrically connected to the high voltage source and configured to generate negative polarity ions and that the apparatus also includes a foraminous filter comprising an electrically conductive material, the filter being electrically coupled to at least one of a voltage source and ground, the filter being positioned over at least one of the air inlet, the air outlet and the electrodes. Additionally, Rump fails to disclose, teach or suggest a bipolar ionizer apparatus having an air mover.

Taken as a whole, Rump discloses an air ionizer for producing active oxygen ions in the air for improved air quality and that the air ionizer is coupled to a plurality of grid-like, flat structures. As mentioned above Partridge specifically notes that a flow of charged ions from an electrode to any nearby grounded conductor or low resistance path (such as one of the opposite polarity grids in Rump) to ground detracts from the desired self-balancing effect and that this is prevented by forming components that might otherwise provide a low resistance path to ground of plastic or other insulative material or by covering such components with a layer of insulative material. The housing including grills, duct and hub and fan blades are all formed wholly of insulative plastic. (Col. 4, line 67 – col. 5, line 6). Thus, the teachings of Partridge would deter one from using the bipolar ionizing pins in an apparatus having a grid or filter formed of an electrically conductive material which is electrically coupled to at least one of a voltage source and ground, as opposed to suggesting such a modification. Thus, the teachings of Rump and Partridge do not suggest the desirability of combining Rump and Partridge in the manner proposed by the Examiner.

It is, therefore, respectfully submitted that claim 1 is not obvious over Rump and there is no desirability or suggestion to modify Rump by the bipolar electrodes of Partridge as proposed by the Examiner. Since dependent claims 9-12 depend upon independent claim 1, it is respectfully submitted that dependent claims 9-12 are also not obvious over Rump in view of Partridge for the same reasons. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103(a) of dependent claims 9-12 should be withdrawn.

CONCLUSION

In view of the foregoing Remarks, it is respectfully submitted that the present application, including claims 1-29, is in condition for allowance and such action is respectfully requested.

Respectfully submitted,

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